The Effects of Fire on Lemhi Penstemon (*Penstemon Lemhiensis)* – Final Monitoring Report 1995 - 2000

Prepared for:

Beaverhead-Deerlodge National Forest
and
Dillon Field Office - Bureau of Land Management

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MONTANA Natural Heritage Program

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Executive Summary

Lemhi penstemon (*Penstemon lemhiensis)* is a short-lived perennial that occupies early-to mid-successional habitats. In Beaverhead County it is found in settings that are dominated by mountain big sagebrush (*Artemisia tridentata ssp. vaseyana).* Previous monitoring indicated that the species was declining in major populations and that new plant recruitment was absent, so we evaluated prescribed burning as a management action for maintaining long-term species viability. The response of *Penstemon lemhiensis* to prescribed burn treatments was determined at 3 sites in Beaverhead County over 5-6 consecutive years, comparing pre- and post-burn trends.

Key indicators of species' viability, including population growth rates and recruitment-to- mortality ratios, increased drastically at one site following a prescribed burn where the species faced competition. Species viability showed little net change in a second site and declined in the third, where results were confounded by grazing effects and incomplete prescribed burn treatment, respectively. We conclude that fire is an appropriate tool in Artemisia tridentata – dominated habitats where the species faces competition. Carefully timed and managed prescribed fire treatments can be used to restore the habitat of Penstemon lemhiensis in cases where competition has increased. After the use of fire for habitat restoration, grazing in treated habitats needs to be managed to allow successful recruitment and reproduction of new individuals. Noxious weed control should be incorporated into any habitat management plans, as needed, to prevent the invasion or further spread of invasive plant species after fire treatments.

We have also demonstrated that population trends for *Penstemon lemhiensis* are well-buffered by the existence of seed banks. Monitoring results indicate that the seed banks can remain viable for at least six years, and support germination and recruitment episodes during years of higher moisture, cooler average temperatures, or taking advantage of disturbance events such as fire.

Illustration of *Penstemon lemhiensis*, by Jeanne R. Janish, from 'Vascular Plants of the Pacific Northwest'

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Seed dormancy tests were conducted by Dr. Susan Meyer (Intermountain Research Station in Provo, Utah.) This work was benefited by early discussions with Caryl Elzinga and Linda Pietarinen. Current Idaho status information on *Penstemon lemhiensis* was provided by Michael Mancuso (Idaho Conservation Data Center.) Population projections were run by Dr. Christine Damiani (Duke University.) The report was edited by Joy Lewis (MTNHP) and formatted by Katrina Scheuerman (NRIS). It benefited by the review of Rob Sutter (Southeast Regional Office of The Nature Conservancy.) Our thanks go out to all these people.

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